

## **VIRGINIA DROUGHT MONITORING TASK FORCE**

### **Drought Status Report**

**December 16, 2010**

Statewide precipitation for the current water year, October 1, 2009 to December 16, 2010 was in the normal range (108% of normal) with all drought evaluation regions greater than 100% normal except the Big Sandy Region (99%), the Shenandoah Region (99%) and the Northern Piedmont Region (99%). Normal precipitation is defined as the mean precipitation for a thirty year period of record. Precipitation greater than 85% and less than 115% of normal is considered to be in the normal range. Statewide precipitation is within the normal range (93%) for the calendar year. Statewide precipitation is 92% of normal since June 1<sup>st</sup> with all drought evaluation regions except the Shenandoah Region, the Northern Piedmont Region, the York-James Region and the Eastern Shore Region having greater than 85% of normal. All state drought regions have now been released from the “Drought Watch” status enacted in July. Appendix A contains precipitation tables for periods dating from October 1, 2009 through December 16, 2010 provided by the Climatology Office of the University of Virginia.

As of December 29, 2010, the National Weather Service Climate Prediction Center 6-10 day climatologic outlooks call for below normal precipitation and below normal temperatures for the entire Commonwealth. The 8-14 day outlooks call for below normal precipitation statewide, except for Suffolk, Chesapeake, and Virginia Beach which is predicted to have normal precipitation. Below normal temperatures are anticipated for the entire state over the 8-14 day period. The one month outlook calls for equal chances of below normal, normal and above normal temperature for the entire Commonwealth, and equal chances of below normal, normal and above normal precipitation for all but the Shenandoah Valley Region which is predicted to have above normal precipitation. The three month outlook calls for equal chances of below normal, normal and above normal precipitation statewide. The three month temperature outlook calls for equal chances of below normal, normal and above normal temperatures statewide except for Southwest Virginia which is predicted to have above-normal temperatures.

The December 14<sup>th</sup>, 2010 NOAA U.S. National Drought Monitor indicates “abnormally dry” drought conditions exist in approximately 20% of the Commonwealth, concentrated in South Central Virginia, Shenandoah County and Frederick County. The Seasonal Drought Outlook for the United States from now through March 2011 forecasts “drought development likely” along the southern border of Virginia from Henry County east to Virginia Beach and “no drought posted or predicted” for the rest of the state. (Appendix D).

The Virginia Department of Health (VDH) reports that 13 systems are under voluntary water conservation requirements and 8 systems are under mandatory water conservation requirements. Of the 55 systems listed in the VDH report, 6 are rated as having a “Better” overall water supply situation, 1 is rated as having a “Worse” overall water supply situation and all other systems are rated as being in a “Stable” situation (Appendix F).

Reports from the Climatology Office of the University of Virginia, the Virginia Department of Environmental Quality, the United States Geological Survey, the Virginia Department of Forestry and the Virginia Department of Agriculture and Consumer Services, follow.

### **Report of the Climatology Office of the University of Virginia**

The first half of December brought a reasonable amount of storm activity to the Commonwealth, but moisture from these systems was largely confined to the Piedmont and mountain regions. Most of the Tidewater was left with a low to very low proportion of normal precipitation for the period.

In addition, November was generally quite dry. During the period beginning October 1, 2010 (the start of the new “Water Year”), only the Big Sandy region has seen normal levels of precipitation. The rest of Virginia has been only in the range of about 80% to 60% of normal.

These colder months also mark a distinct decline in the rate of moisture loss to evaporation, and allow precipitation an opportunity to penetrate the soil layers and replenish long-term reserves. Thus, storm activity from late fall to early spring is crucial to water supplies. A season with relatively few such systems often leads to a summer with long-term moisture difficulties.

The relatively dry beginning of this critical period is unfortunate, given the depletion of moisture reserves during the past growing season. Long-range outlooks for this winter, thus far, inspire little optimism for making up deficits.

### **United States Geological Survey Streamflow and Ground Water Levels**

Streamflows are between normal and below normal ranges across the Commonwealth except in the far southwest portions of the State where streamflow are in the normal to above normal ranges (Appendix G, Figure 1). Below normal drought conditions based on daily average streamflow are occurring in the upper reaches of the Roanoke River Basin, and in the Potomac, York, James, Chowan and Roanoke River Basins. Lower flows measured at gages in the smaller-headwater streams result in minor drought conditions persisting in the eastern portions of the State (Appendix H, Figure 2).

A majority of the wells in the Climate Response Network are still in the normal range. Several wells are below to well below normal range, especially in the Potomac River Basin (Appendix I, Figure 3). Most of the wells had water-level rises in response to the rainfall or snowfall this fall.

Precipitation, especially snowfall, during the prime recharge period in the winter and early spring months will determine streamflow conditions next summer.

### **Virginia Department of Environmental Quality Conditions of Major Reservoirs**

Levels of large reservoirs statewide are at or above normal levels. Four large multi-purpose reservoirs are identified as drought indicators in the *Virginia Drought Assessment and Response Plan* (Plan); Smith Mountain Lake, Lake Moomaw, Lake Anna and Kerr Reservoir. Three of these four of these reservoirs are currently at levels above their Drought Watch stages. Lake Moomaw on the Jackson River is currently 0.71 feet below its Drought Watch Level. Below is a summary of large reservoir conditions:

- As of December 30, Lake Moomaw on the Jackson River is at 1564.29 feet, and is dropping at a rate of approximately 0.03 ft per day. Approximately 32.9% of conservation storage remains. Lake Moomaw is 0.71ft below the Drought Watch level (1565 feet MSL).
- As of December 29, Kerr Reservoir was approximately 2.10 ft above the Guide Curve and was anticipated to drop 0.40 ft by January 5, 2011. Drought Watch status is reached at greater than 3 ft below the Guide Curve.
- As of December 29, Smith Mountain Lake was at elevation 793.72 ft. The Drought Watch stage for Smith Mountain Lake is elevation 793 feet and below.
- As of December 30, Lake Anna was at elevation 248.7 feet (1.3 feet below full). The Drought Watch stage for Lake Anna Lake is elevation 248 feet and below.

**Virginia Department of Agriculture and Consumer Services**  
**Status of Agricultural Drought**

Sixty-nine Virginia localities have formally requested the Governor's assistance in obtaining federal agricultural disaster designation due to drought conditions. On November 4, 2010, U.S. Secretary of Agriculture Thomas J. Vilsack named sixty of the localities primary disaster areas due to losses caused by drought and related disasters that occurred in 2010: Accomack, Albemarle, Amelia, Amherst, Appomattox, Bedford, Brunswick, Buckingham, Campbell, Caroline, Carroll, Charlotte, Clarke, Culpeper, Cumberland, Dinwiddie, Essex, Fauquier, Fluvanna, Franklin, Frederick, Goochland, Greene, Greensville, Halifax, Hanover, Isle of Wight, James City, King and Queen, King George, King William, Lancaster, Louisa, Lunenburg, Mecklenburg, Middlesex, Montgomery, Nelson, Northampton, Northumberland, Nottoway, Orange, Page, Patrick, Pittsylvania, Powhatan, Prince Edward, Pulaski, Rappahannock, Richmond (County), Rockbridge, Shenandoah, Southampton, Spotsylvania, Stafford, Suffolk (City), Surry, Warren, Westmoreland and York. The loss assessment reports for the remaining nine localities have been received from USDA/Farm Service Agency and an official request for disaster designation due to drought from the Governor on behalf of these localities has been sent to Secretary Vilsack. The nine localities are: Botetourt, Charles City, Craig, Gloucester, Henrico, Mathews, New Kent, Prince George and Sussex.

# APPENDIX A

## Precipitation Departures by Drought Evaluation Region

### PRELIMINARY PRECIPITATION SUMMARY

Prepared:  
12/20/10

DROUGHT REGION	OBSERVED	Dec 1, 2010 NORMAL	- Dec 16, 2010 DEPARTURE	% OF NORM.
1 Big Sandy	2.72	1.88	0.84	145%
2 New River	1.94	1.40	0.54	139%
3 Roanoke	1.87	1.68	0.20	112%
4 Upper James	1.97	1.52	0.45	130%
5 Middle James	2.19	1.64	0.55	134%
6 Shenandoah	1.97	1.34	0.64	148%
7 Northern Virginia	2.44	1.60	0.84	153%
8 Northern Piedmont	2.83	1.69	1.13	167%
9 Chowan	1.07	1.56	-0.49	68%
10 Northern Coastal Plain	1.46	1.69	-0.24	86%
11 York-James	0.49	1.75	-1.26	28%
12 Southeast Virginia	0.56	1.64	-1.08	34%
13 Eastern Shore	0.58	1.67	-1.10	34%
Statewide	1.93	1.61	0.32	120%

DROUGHT REGION	OBSERVED	Nov 1, 2010 NORMAL	- Dec 16, 2010 DEPARTURE	% OF NORM.
1 Big Sandy	6.05	5.16	0.89	117%
2 New River	4.99	4.43	0.56	113%
3 Roanoke	4.22	5.04	-0.81	84%
4 Upper James	4.48	4.88	-0.40	92%
5 Middle James	4.52	5.15	-0.63	88%
6 Shenandoah	4.00	4.39	-0.39	91%
7 Northern Virginia	4.15	5.01	-0.86	83%
8 Northern Piedmont	5.11	5.49	-0.39	93%
9 Chowan	2.92	4.67	-1.75	63%
10 Northern Coastal Plain	3.48	4.83	-1.36	72%
11 York-James	2.06	5.12	-3.06	40%
12 Southeast Virginia	2.28	4.71	-2.43	48%
13 Eastern Shore	1.78	4.61	-2.83	39%
Statewide	4.26	4.84	-0.58	88%

DROUGHT REGION	OBSERVED	Oct 1, 2010 NORMAL	- Dec 16, 2010 DEPARTURE	% OF NORM.
1 Big Sandy	8.47	8.04	0.43	105%
2 New River	6.91	7.60	-0.69	91%
3 Roanoke	7.04	8.75	-1.71	81%
4 Upper James	6.70	8.13	-1.43	82%
5 Middle James	7.26	8.99	-1.73	81%
6 Shenandoah	5.24	7.58	-2.33	69%
7 Northern Virginia	6.79	8.49	-1.70	80%
8 Northern Piedmont	7.40	9.48	-2.09	78%

9	Chowan	5.47	8.25	-2.78	66%
10	Northern Coastal Plain	6.18	8.34	-2.17	74%
11	York-James	5.61	8.65	-3.04	65%
12	Southeast Virginia	5.32	8.37	-3.05	64%
13	Eastern Shore	4.43	7.82	-3.39	57%
	Statewide	6.71	8.34	-1.63	80%

	DROUGHT REGION	OBSERVED	Sep 1, 2010 NORMAL	- Dec 16, 2010 DEPARTURE	% OF NORM.
1	Big Sandy	10.78	11.50	-0.72	94%
2	New River	10.86	11.01	-0.14	99%
3	Roanoke	13.30	12.98	0.32	102%
4	Upper James	12.22	11.63	0.59	105%
5	Middle James	13.36	13.12	0.25	102%
6	Shenandoah	10.24	11.25	-1.01	91%
7	Northern Virginia	13.21	12.56	0.65	105%
8	Northern Piedmont	13.69	13.76	-0.07	99%
9	Chowan	13.76	12.68	1.09	109%
10	Northern Coastal Plain	13.86	12.43	1.42	111%
11	York-James	14.88	13.55	1.33	110%
12	Southeast Virginia	18.60	12.80	5.80	145%
13	Eastern Shore	9.00	11.43	-2.44	79%
	Statewide	12.75	12.34	0.41	103%

	DROUGHT REGION	OBSERVED	Aug 1, 2010 NORMAL	- Dec 16, 2010 DEPARTURE	% OF NORM.
1	Big Sandy	15.91	15.33	0.58	104%
2	New River	16.11	14.32	1.79	112%
3	Roanoke	19.73	16.70	3.03	118%
4	Upper James	15.20	14.96	0.23	102%
5	Middle James	17.55	16.94	0.62	104%
6	Shenandoah	12.94	14.58	-1.64	89%
7	Northern Virginia	17.47	16.41	1.06	106%
8	Northern Piedmont	17.10	17.58	-0.49	97%
9	Chowan	18.03	16.99	1.04	106%
10	Northern Coastal Plain	18.20	16.29	1.90	112%
11	York-James	16.58	18.42	-1.84	90%
12	Southeast Virginia	21.80	17.92	3.87	122%
13	Eastern Shore	13.77	15.30	-1.53	90%
	Statewide	17.11	16.17	0.94	106%

	DROUGHT REGION	OBSERVED	Jul 1, 2010 NORMAL	- Dec 16, 2010 DEPARTURE	% OF NORM.
1	Big Sandy	19.65	19.81	-0.16	99%
2	New River	18.95	18.11	0.84	105%
3	Roanoke	22.99	21.09	1.90	109%
4	Upper James	18.85	19.00	-0.15	99%
5	Middle James	19.42	21.35	-1.93	91%
6	Shenandoah	16.32	18.34	-2.02	89%
7	Northern Virginia	20.94	20.18	0.75	104%
8	Northern Piedmont	19.42	21.98	-2.56	88%

9	Chowan	19.72	21.50	-1.78	92%
10	Northern Coastal Plain	19.66	20.74	-1.09	95%
11	York-James	19.94	23.52	-3.58	85%
12	Southeast Virginia	25.52	22.99	2.53	111%
13	Eastern Shore	15.86	19.30	-3.44	82%
	Statewide	19.89	20.51	-0.62	97%

	DROUGHT REGION	OBSERVED	Jun 1, 2010 NORMAL	- Dec 16, 2010 DEPARTURE	% OF NORM.
1	Big Sandy	24.43	23.95	0.48	102%
2	New River	21.52	21.96	-0.44	98%
3	Roanoke	25.07	24.98	0.10	100%
4	Upper James	20.70	22.71	-2.01	91%
5	Middle James	21.29	24.86	-3.57	86%
6	Shenandoah	18.15	22.05	-3.90	82%
7	Northern Virginia	22.28	24.04	-1.76	93%
8	Northern Piedmont	21.83	25.99	-4.16	84%
9	Chowan	22.24	25.15	-2.91	88%
10	Northern Coastal Plain	21.67	24.30	-2.64	89%
11	York-James	20.87	26.93	-6.06	78%
12	Southeast Virginia	28.76	26.60	2.16	108%
13	Eastern Shore	17.39	22.28	-4.90	78%
	Statewide	22.25	24.30	-2.05	92%

	DROUGHT REGION	OBSERVED	May 1, 2010 NORMAL	- Dec 16, 2010 DEPARTURE	% OF NORM.
1	Big Sandy	29.88	28.77	1.11	104%
2	New River	25.33	26.17	-0.84	97%
3	Roanoke	29.72	29.31	0.41	101%
4	Upper James	24.51	26.99	-2.48	91%
5	Middle James	25.34	29.10	-3.76	87%
6	Shenandoah	21.21	25.89	-4.68	82%
7	Northern Virginia	26.92	28.38	-1.46	95%
8	Northern Piedmont	25.50	30.21	-4.71	84%
9	Chowan	27.66	29.24	-1.58	95%
10	Northern Coastal Plain	24.06	28.46	-4.40	85%
11	York-James	25.77	31.20	-5.43	83%
12	Southeast Virginia	32.96	30.46	2.50	108%
13	Eastern Shore	19.50	25.80	-6.30	76%
	Statewide	26.42	28.56	-2.14	93%

	DROUGHT REGION	OBSERVED	Apr 1, 2010 NORMAL	- Dec 16, 2010 DEPARTURE	% OF NORM.
1	Big Sandy	32.56	32.53	0.03	100%
2	New River	27.17	29.72	-2.54	91%
3	Roanoke	31.48	33.11	-1.63	95%
4	Upper James	26.21	30.39	-4.18	86%
5	Middle James	27.09	32.44	-5.35	84%
6	Shenandoah	22.56	28.81	-6.25	78%
7	Northern Virginia	28.51	31.68	-3.17	90%

8	Northern Piedmont	27.04	33.50	-6.47	81%
9	Chowan	29.10	32.67	-3.57	89%
10	Northern Coastal Plain	25.66	31.55	-5.89	81%
11	York-James	26.72	34.50	-7.78	77%
12	Southeast Virginia	34.15	33.71	0.44	101%
13	Eastern Shore	20.68	28.72	-8.04	72%
	Statewide	28.13	31.98	-3.85	88%

	DROUGHT REGION	OBSERVED	Mar 1, 2010 NORMAL	- Dec 16, 2010 DEPARTURE	% OF NORM.
1	Big Sandy	35.43	36.78	-1.35	96%
2	New River	31.24	33.39	-2.15	94%
3	Roanoke	36.61	37.38	-0.77	98%
4	Upper James	30.31	34.18	-3.87	89%
5	Middle James	32.23	36.50	-4.27	88%
6	Shenandoah	27.28	32.01	-4.73	85%
7	Northern Virginia	32.26	35.34	-3.09	91%
8	Northern Piedmont	31.96	37.31	-5.35	86%
9	Chowan	33.68	37.04	-3.35	91%
10	Northern Coastal Plain	31.81	35.83	-4.03	89%
11	York-James	32.33	39.19	-6.86	83%
12	Southeast Virginia	40.46	37.91	2.55	107%
13	Eastern Shore	26.91	33.03	-6.12	81%
	Statewide	32.83	36.02	-3.19	91%

	DROUGHT REGION	OBSERVED	Feb 1, 2010 NORMAL	- Dec 16, 2010 DEPARTURE	% OF NORM.
1	Big Sandy	38.20	40.36	-2.16	95%
2	New River	33.66	36.32	-2.66	93%
3	Roanoke	39.26	40.69	-1.42	97%
4	Upper James	32.64	37.03	-4.40	88%
5	Middle James	35.45	39.62	-4.17	89%
6	Shenandoah	30.15	34.42	-4.26	88%
7	Northern Virginia	36.30	38.01	-1.71	95%
8	Northern Piedmont	34.49	40.28	-5.80	86%
9	Chowan	36.93	40.21	-3.27	92%
10	Northern Coastal Plain	35.10	38.97	-3.87	90%
11	York-James	36.02	42.72	-6.70	84%
12	Southeast Virginia	44.21	41.41	2.80	107%
13	Eastern Shore	30.79	36.22	-5.43	85%
	Statewide	35.80	39.15	-3.35	91%

	DROUGHT REGION	OBSERVED	Jan 1, 2010 NORMAL	- Dec 16, 2010 DEPARTURE	% OF NORM.
1	Big Sandy	42.44	44.09	-1.65	96%
2	New River	38.17	39.53	-1.36	97%
3	Roanoke	44.33	44.61	-0.27	99%
4	Upper James	36.96	40.31	-3.36	92%

5	Middle James	39.84	43.28	-3.44	92%
6	Shenandoah	33.96	37.27	-3.30	91%
7	Northern Virginia	39.00	41.29	-2.29	94%
8	Northern Piedmont	38.41	43.80	-5.39	88%
9	Chowan	40.95	44.32	-3.36	92%
10	Northern Coastal Plain	38.81	42.72	-3.92	91%
11	York-James	40.45	46.86	-6.41	86%
12	Southeast Virginia	48.53	45.57	2.96	106%
13	Eastern Shore	33.81	39.78	-5.97	85%
	Statewide	40.01	42.79	-2.79	93%

DROUGHT REGION		OBSERVED	Dec 1, 2009 NORMAL	- Dec 16, 2010 DEPARTURE	% OF NORM.
1	Big Sandy	48.13	47.73	0.40	101%
2	New River	45.46	42.24	3.22	108%
3	Roanoke	51.90	47.86	4.04	108%
4	Upper James	44.34	43.26	1.08	102%
5	Middle James	47.99	46.45	1.54	103%
6	Shenandoah	39.21	39.86	-0.65	98%
7	Northern Virginia	45.25	44.39	0.86	102%
8	Northern Piedmont	44.90	47.08	-2.18	95%
9	Chowan	48.90	47.34	1.56	103%
10	Northern Coastal Plain	46.71	46.00	0.71	102%
11	York-James	47.40	50.25	-2.85	94%
12	Southeast Virginia	56.34	48.75	7.59	116%
13	Eastern Shore	42.34	43.02	-0.68	98%
	Statewide	47.15	45.91	1.24	103%

DROUGHT REGION		OBSERVED	Nov 1, 2009 NORMAL	- Dec 16, 2010 DEPARTURE	% OF NORM.
1	Big Sandy	50.38	51.01	-0.63	99%
2	New River	50.45	45.27	5.19	111%
3	Roanoke	60.08	51.22	8.86	117%
4	Upper James	49.23	46.62	2.61	106%
5	Middle James	56.56	49.96	6.61	113%
6	Shenandoah	43.06	42.91	0.16	100%
7	Northern Virginia	49.18	47.80	1.38	103%
8	Northern Piedmont	50.97	50.88	0.08	100%
9	Chowan	58.54	50.45	8.09	116%
10	Northern Coastal Plain	55.46	49.14	6.32	113%
11	York-James	56.66	53.62	3.04	106%
12	Southeast Virginia	66.72	51.82	14.90	129%
13	Eastern Shore	49.89	45.96	3.93	109%
	Statewide	53.78	49.14	4.64	109%

DROUGHT REGION		OBSERVED	Oct 1, 2009 NORMAL	- Dec 16, 2010 DEPARTURE	% OF NORM.
----------------	--	----------	-----------------------	-----------------------------	------------

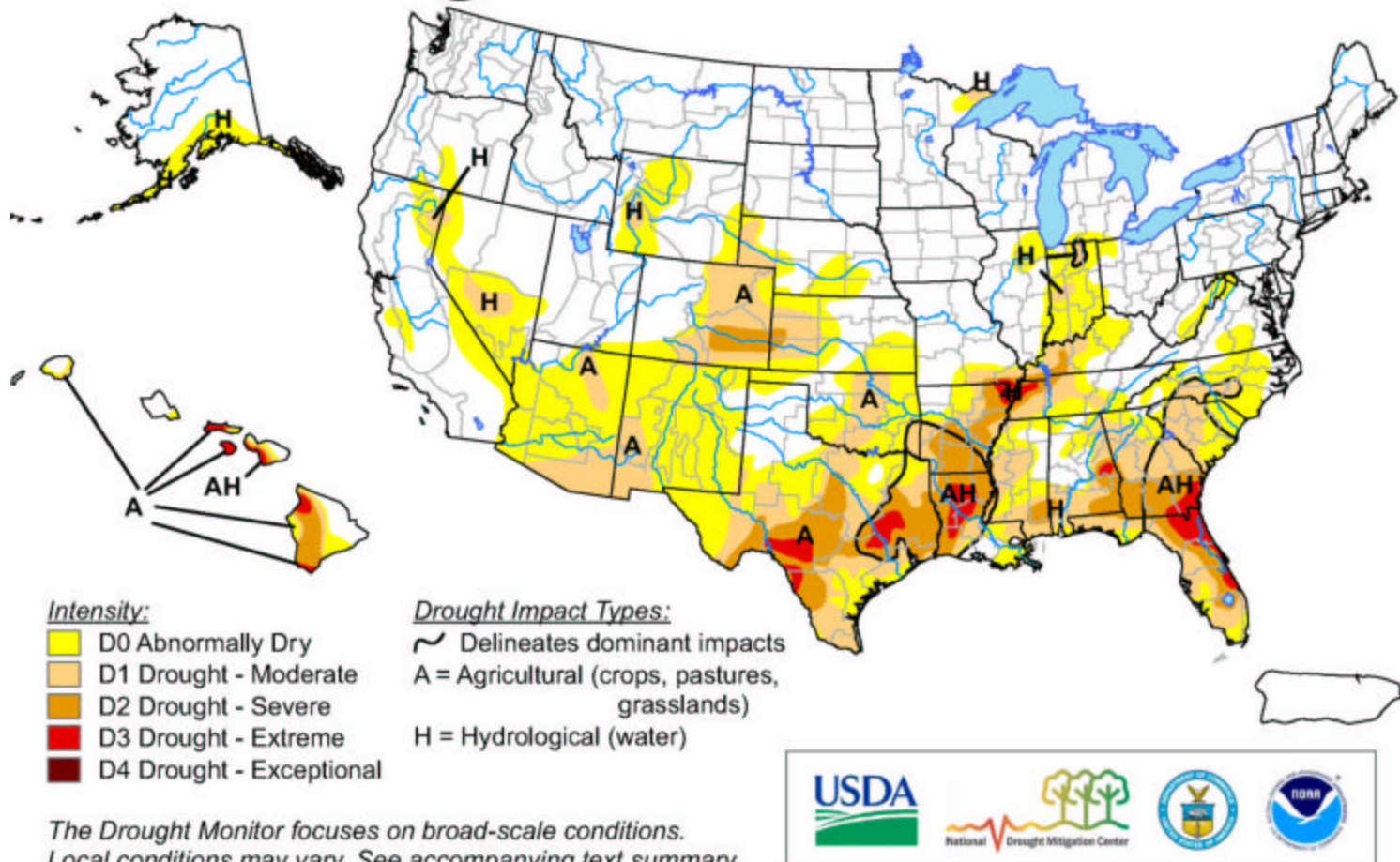
1	Big Sandy	53.42	53.89	-0.47	99%
2	New River	53.14	48.44	4.71	110%
3	Roanoke	62.64	54.93	7.71	114%
4	Upper James	52.02	49.87	2.15	104%
5	Middle James	59.62	53.80	5.82	111%
6	Shenandoah	45.82	46.10	-0.28	99%
7	Northern Virginia	53.99	51.28	2.71	105%
8	Northern Piedmont	54.38	54.87	-0.49	99%
9	Chowan	60.59	54.03	6.56	112%
10	Northern Coastal Plain	59.68	52.65	7.03	113%
11	York-James	59.75	57.15	2.60	105%
12	Southeast Virginia	69.03	55.48	13.55	124%
13	Eastern Shore	54.27	49.17	5.09	110%
	Statewide	56.79	52.64	4.15	108%

## APPENDIX B

# U.S. Drought Monitor

December 14, 2010

Valid 7 a.m. EST



The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

<http://drought.unl.edu/dm>

Released Thursday, December 16, 2010

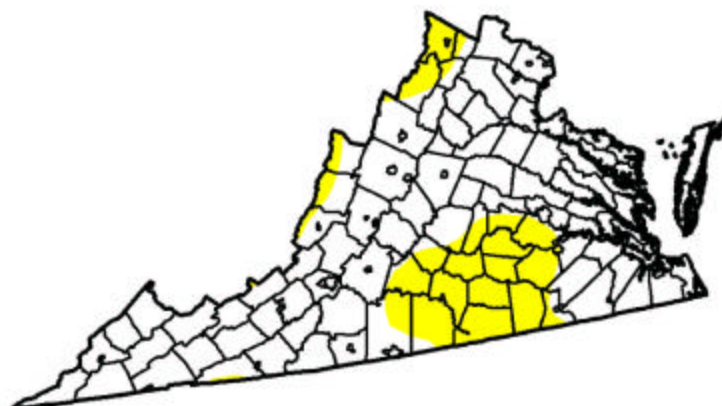
Author: David Miskus, NOAA/NWS/NCEP/CPC

# APPENDIX C

## U.S. Drought Monitor Virginia

December 14, 2010  
Valid 7 a.m. EST

	Drought Conditions (Percent Area)					
	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	80.0	20.0	0.0	0.0	0.0	0.0
Last Week (12/07/2010 map)	75.5	24.5	0.0	0.0	0.0	0.0
3 Months Ago (09/21/2010 map)	10.9	89.1	50.3	31.3	0.8	0.0
Start of Calendar Year (01/05/2010 map)	100.0	0.0	0.0	0.0	0.0	0.0
Start of Water Year (10/05/2010 map)	51.8	48.2	7.6	0.9	0.0	0.0
One Year Ago (12/15/2009 map)	100.0	0.0	0.0	0.0	0.0	0.0



### Intensity:

<span style="background-color: yellow; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span> D0 Abnormally Dry	<span style="background-color: red; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span> D3 Drought - Extreme
<span style="background-color: orange; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span> D1 Drought - Moderate	<span style="background-color: darkred; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span> D4 Drought - Exceptional
<span style="background-color: lightorange; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span> D2 Drought - Severe	

The Drought Monitor focuses on broad-scale conditions.  
Local conditions may vary. See accompanying text summary  
for forecast statements.

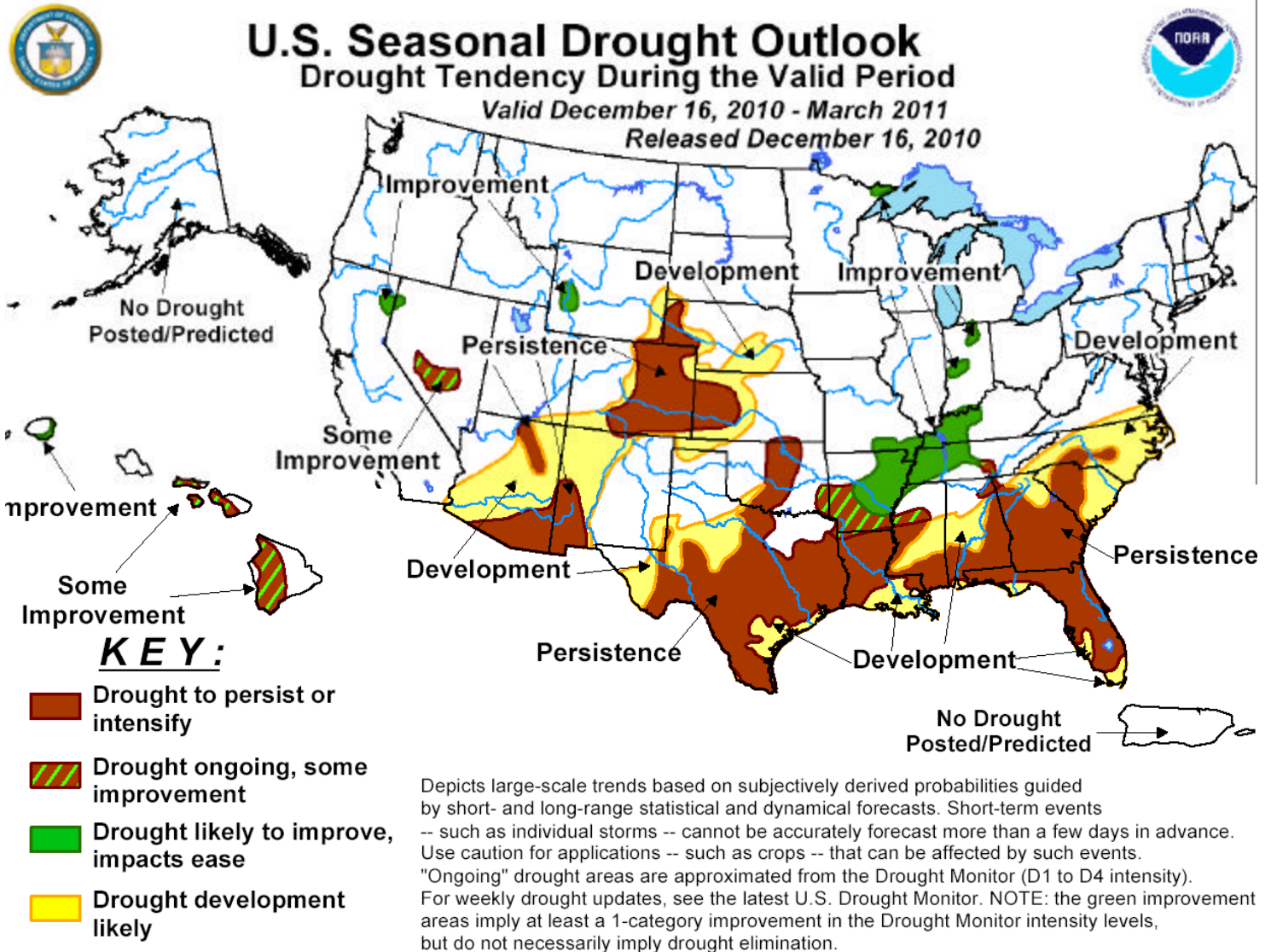
<http://drought.unl.edu/dm>



Released Thursday, December 16, 2010

Author: D. Miskus, CPC/NOAA

# APPENDIX D

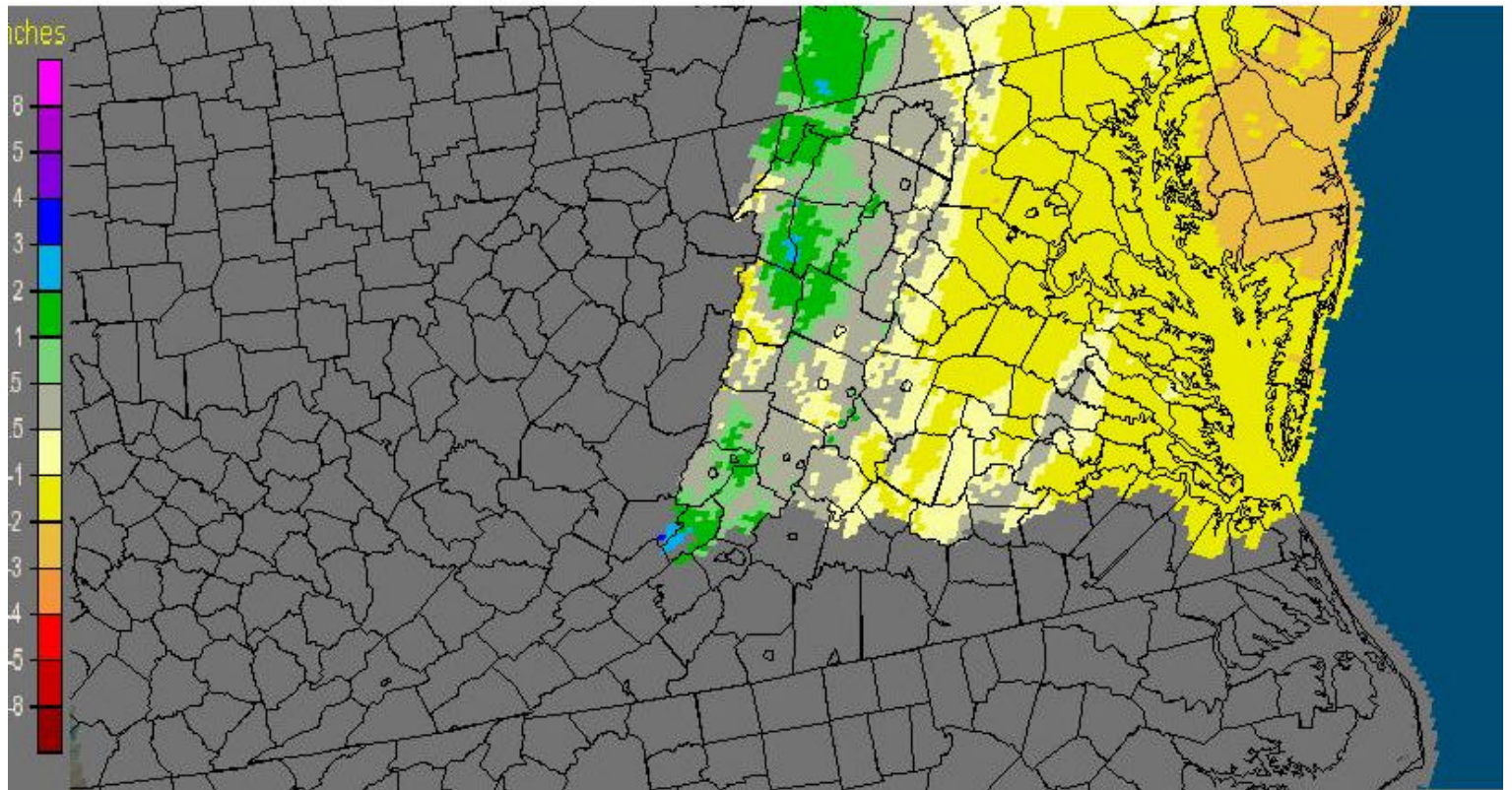


## APPENDIX E

### 30-Day Departure from Normal Precipitation Valid December 21, 2010

Virginia: Current 30-Day Departure from Normal Precipitation

Valid at 12/21/2010 1200 UTC- Created 12/21/10 14:20 UTC



# APPENDIX F

## Condition of Public Water Supplies

### December 15, 2010

**ODW Drought Situation Report**

Date: **12/15/10**

	Restriction totals	Population Totals
Mandatory	8	10,058
Voluntary	13	196,695
<b>Total</b>	<b>21</b>	206,753

N-None  
M-Mandatory  
V-Voluntary

B-Better  
S-Stable/Same  
W-Worse

PWSID	Waterworks	Source Name	Restrictions	Situation	Population Served
2003050	ACSA - Crozet	Beaver Creek Reservoir	V	S - 12/14/10 - Will continue voluntary conservation.	6,310
2003051	ACSA - Scottsville	Totier Creek Reservoir	V	S - 12/14/10 - Will continue voluntary conservation.	723
2003053	ACSA - Urban Area	Sugar Hollow, Ragged Mtn., South Rivanna, North Rivanna	V	S - 12/14/10 - Will continue voluntary conservation.	55,510
2005095	Cherokee	City of Covington (Jackson River)	M	S - 12/14/10 - Mandatory conservation due to DEQ agreement relative to water level at Lake Moomaw (not a drinking water source, headwaters of Jackson River).	486
2005160	Cliftondale Park/Wilson Creek/Sharon	Town of Clifton Forge (Smith Creek)	M	S - 12/14/10 - Mandatory conservation due to DEQ agreement relative to water level at Lake Moomaw (not a drinking water source, headwaters of Jackson River).	1,629
2005440	Intervale/Clearwater Park	City of Covington (Jackson River)	M	S - 12/14/10 - Mandatory conservation due to DEQ agreement relative to water level at Lake Moomaw (not a	1,179

				drinking water source, headwaters of Jackson River).	
2005600	Pounding Mill	City of Covington (Jackson River)	M	S - 12/14/10 - Mandatory conservation due to DEQ agreement relative to water level at Lake Moomaw (not a drinking water source, headwaters of Jackson River).	1,775
2005800	Rosedale/Callaghan	City of Covington (Jackson River)	M	S - 12/14/10 - Mandatory conservation due to DEQ agreement relative to water level at Lake Moomaw (not a drinking water source, headwaters of Jackson River).	800
2005840	Selma/Low Moor/Valley Ridge	Town of Clifton Forge (Smith Creek)	M	S - 12/14/10 - Mandatory conservation due to DEQ agreement relative to water level at Lake Moomaw (not a drinking water source, headwaters of Jackson River).	1,767
2005950	Wesgate	Town of Clifton Forge (Smith Creek)	M	S - 12/14/10 - Mandatory conservation due to DEQ agreement relative to water level at Lake Moomaw (not a drinking water source, headwaters of Jackson River).	288
2540500	City of Charlottesville	Sugar Hollow, Ragged Mtn., South Rivanna, North Rivanna	V	S - 12/14/10 - Will continue voluntary conservation.	41,487
3053280	DCWA Central (Dinwiddie County)	Appomattox River Water Authority (ARWA)	V	<b>S</b> - 12/13/2010 - Went to voluntary conservation status as 11/5/10	6,800
3081550	GCWSA - Jarratt	Nottoway River	N	<b>S</b> - 12/13/2010 - Waterworks production rate reduced due to lower demand and plant clearwell	7,190

				being off-line; river level sufficient to allow plant operation at 1.5 mgd. Gage at Stony Creek indicates 3.3 feet.	
3093120	Isle of Wight County	Suffolk	N	<b>B</b> - 12/15/10 - Obtains water from Suffolk. Follows Suffolk's lead on conservation.	1,284
3095490	James City Service Authority	Ground water	N	<b>S</b> - 12/14/10 - Went off all conservaton on 10/15/10. No restrictions in place at all.	49,880
3149700	Puddledock Road	ARWA	V	<b>S</b> - 12/13/2010 - ARWA lifted restrictions - voluntary conservation as of 11/5/10.	9,723
3550050	Chesapeake - Western Branch system	City of Portsmouth	N	<b>S</b> -12/15/2010 This portion of the city is consecutive to (receives water from) the city of Portsmouth. Will follow Portsmouth's lead on conservation.	36,633
3550051	Chesapeake	Northwest River, City of Norfolk Raw Water (Lake Gaston)	N	<b>S</b> -12/15/2010 Total rainfall for December is 1.70 inches. There are no water restrictions in Chesapeake. Chlorides are used as an indicator of drought, the higher the levels the more concentrated the contaminant in a lesser amount of surface water. They remain low at 44 mg/l. Continuing to purchase raw water from Norfolk (7.0 MGD average). NWR averages 2.5 MGD. The Intown Lakes remain full and there are no irregularities in the	104,722

				tidal patterns in NWR.	
3550052	Chesapeake - South Norfolk system	City of Norfolk	N	<b>S</b> -12/15/2010-This portion of the city is consecutive to (receives water from) the city of Norfolk. Will start to distribute more purchased water from Norfolk throughout service area. Will follow Norfolk's lead on conservation.	37,880
3570150	Colonial Heights	ARWA	V	<b>S</b> - 12/13/2010 - ARWA lifted restrictions - voluntary conservation as of 11/5/10.	17,286
3595250	Emporia	Meherrin River	N	<b>S</b> - 12/13/2010 - Reservoir level sufficient for normal operation.	5,600
3670800	Virginia-American Water Company (Hopewell)	Appomattox & James Rivers	N	<b>S</b> - 12/13/2010 - Level at intakes sufficient to supply plant. Still detecting MIB (taste & odor) in raw and finished water, but less than 10 ng/L.	28000 - Primary / 45463 Total including Consecutive System (Ft. Lee)
3700500	Newport News	Chickahomony River, Skiffs Creek, Diascand, Little Creek, Harwoods Mill, Lee Hall	N	<b>B</b> - 12/13/10 - * Reservoir Status: 86 % Full * 33.2 Million Gallons Delivered	414,000
3710100	Norfolk	Lake Prince, Lake Burnt Mills, Western Branch reservoir, Nottoway River, Blackwater River, 4 western wells; Little Creek reservoir, Lakes Smith, Lawson, Whitehurst, and Wright. Lake Gaston.	N	<b>S</b> - As of 12/15/10, reservoirs at 86.7% (down from 94.7% on 11/02/10). Historic reservoir capacity is 85.1% at this time of year. Avg. pumping from Lake Gaston = 32.6 MGD. Total	261,250 - Primary / 755,617 - Total including consecutive systems (Va Beach + military bases).

				Reservoir Storage = 13,181 MG.	
3730750	Petersburg	ARWA	V	<b>S</b> - 12/13/2010 - Mandatory restrictions lifted as of 11/09/2010. City requesting residents voluntarily use conservation measures.	33,740
3740600	Portsmouth	Lakes Cohoon, Meade, Kilby, and Speights Run	N	<b>S</b> - As of 12/10/10, reservoirs at 99% (from 100% on 10/29/10 ). Median reservoir capacity is 96% for the month and historical average capacity is 89% (period of 1969-2008). The emergency wells are OFF.	100,400 - Primary / 120,400 Total including consecutive systems (military bases)
3800805	Suffolk	Lone Star Lakes, Cumps Mill Pond	N	<b>B</b> -12/15/2010-Will follow Portsmouth's lead and the region as far as conservation. Received 1.18 inches of rain from 12/6/2010 through 12/13/2010. Average reservoir levels : Southern Lakes at 72.5% capacity, for the Northern Lakes at 110.59% and Crumps Mill Pond at 100% . No conservation measures implemented at this time but will continue to monitor.	66,631
3810900	Virginia Beach	Norfolk	N	<b>S</b> - 12/15/10 - Obtains water from Norfolk.	423,743
3830850	Williamsburg	Waller Mill Reservoir	N	<b>"W"</b> 12/15/10: 2" above primary spillway - about 92% of usable capacity.	16,400

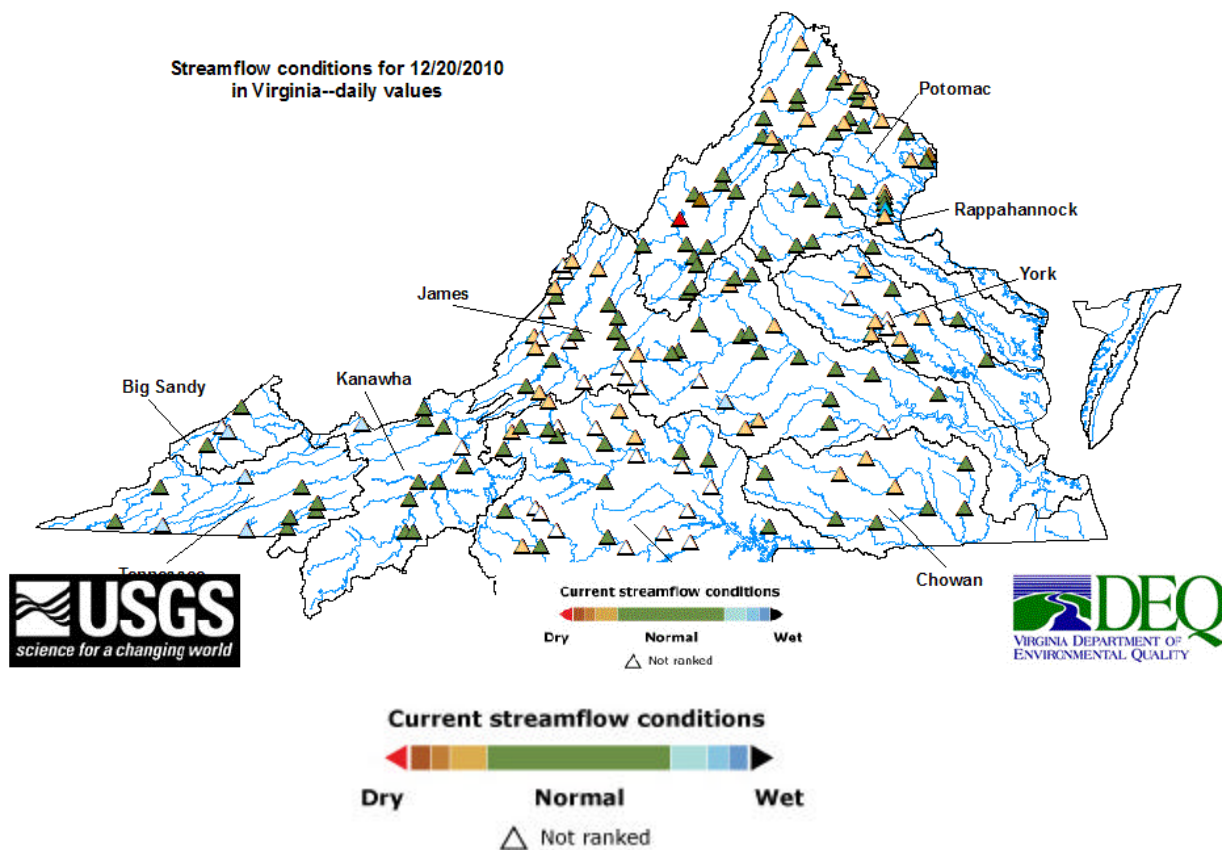
4041035	APPOMATTOX RIVER WATER AUTHORITY	Surface water; Lake Chesdin	N	<b>S</b> - Wholesaler to Chesterfield County, Prince George County, Dinwiddie County; Cities of Petersburg and Colonial Heights. Mandatory restrictions have been lifted.	<b>200,000</b>
4041845	CHESTERFIELD CO CENTRAL WATER SYSTEM	Surface water; Swift Creek reservoir; purchases finished water	N	<b>S</b> - Purchases water from the City of Richmond and the Appomattox River Water Authority. Mandatory restrictions have been lifted.	286,000
4057800	TAPPAHANNOCK, TOWN OF	Groundwater wells	N	<b>S</b>	2,100
4073311	GLOUCESTER CO WATER TREATMENT PLT	Surface water, Beaverdam reservoir; 2 deep groundwater wells	N	<b>S</b> -Reservoir is full.	12,000
4075283	EASTERN GOOCHLAND CENTRAL WATER SYSTEM	Purchased surface water	V	<b>S</b> -purchases water from Henrico County	2,500
4075735	JAMES RIVER CORRECTIONAL CTR	Surface water; James River	N	<b>S</b> - Conservation at all DOC facilities	9,300
4085398	HANOVER SUBURBAN WATER SYSTEM	Surface water; North Anna River; some groundwater wells; purchases finished water	N	<b>S (see Richmond)</b>	71,000
4085770	SPRING MEADOWS-MEADOW GATE	Groundwater wells	N	<b>S</b>	2,300
4087125	HENRICO COUNTY WATER SYSTEM	Surface water; James River	N	<b>S (see Richmond)</b>	289,000
4101900	WEST POINT, TOWN OF	Groundwater wells	N	<b>S</b>	3,000
4127110	DELMARVA PROPERTIES	Groundwater wells	N	<b>S</b> -New Kent Co. encourages conservation at all county owned waterworks.	7,700
4145675	POWHATAN COURTHOUSE	Groundwater wells	N	<b>S</b>	2,600
4193280	COLONIAL BEACH, TOWN OF	Groundwater wells	N	<b>S</b>	3,300

4760100	RICHMOND, CITY OF	Surface water; James River	N	<b>S</b> - water levels do not affect intake; James River Regional Flow Management Plan set restrictions based on James River level for counties of Henrico, Chesterfield, Goochland, and Hanover counties, which purchase water from the City.	197,000
6033085	Caroline Utility	Groundwater	N	<b>S</b> - Mandatory water use restriction of High-Level 3 went into effect 7/13/2010. On 9/14/2010, restriction level was reduced to Low - Level 1 due to decreased customer demand. On 11/16/2010, restrictions were lifted. (Updated 12/08/10)	3,600 Primary
6047500	Town of Culpeper	Surface water - Lake Pelham	N	S - Lake Pelham level was 3" above overflow invert on 12/13.	14,200
6059501	Fairfax Water	Surface Water - Potomac River and Occoquan Reservoir	N	B - 12/15/10 - Potomac River is flowing at about 4,900 cuft/sec, which is safely above the watch level. Occoquan Reservoir is full.	823,216 primary 1.8MM total
6061200	Marshall	Groundwater	<b>M</b>	<b>S</b> - The WSA Alert Messaging Service maintains the Water Use Restriction Notice as of 12/14/2010. The mandatory water use restriction is not directly drought related but depends on water source development.	2,134
6061600	Town of Warrenton	Surface (Cedar Run) and groundwater	V	S-On Tuesday December 13, Warrenton	11,160

				Reservoir surface was at 441.3 ft vs full level of 445.3 ft. Water is being transferred from Airlie Reservoir.	
6107150	Town of Hamilton	Groundwater	V	S - 12/15/2010 Voluntary water use restrictions initiated 7/6/2010. No supply problems.	2,000
6107300	Town of Leesburg	Surface Water - Potomac River	N	B - 12/15/10 - Potomac River is flowing at about 4,900 cuft/sec, which is safely above the watch level.	46,300
6107600	Town of Purcellville	Surface water/groundwater	V	B - 12/15/10 - Surface water reservoir is full and is overflowing. Voluntary water conservation initiated 7/2/10. No water supply problems.	6,300
6107650	Town of Round Hill	Groundwater	V	S - 12/15/10 - Voluntary water use restrictions replaced mandatory on 10/21/10. No problems.	3,156
6137500	Town of Orange	Surface: Rapidan River	N	S - 14-day average of Rapidan River flow was 1015 cfs on 12/13.	4,500
6137999	Wilderness	Surface - Rapidan River	N	S	11,331
6600100	City of Fairfax	Surface Water	N	S - 11/09/10 Goose Creek flow has increased sufficiently to take Beaver Dam Reservoir off-line 9/29/10. Beaver Dam is refilling.	24,000

# APPENDIX G

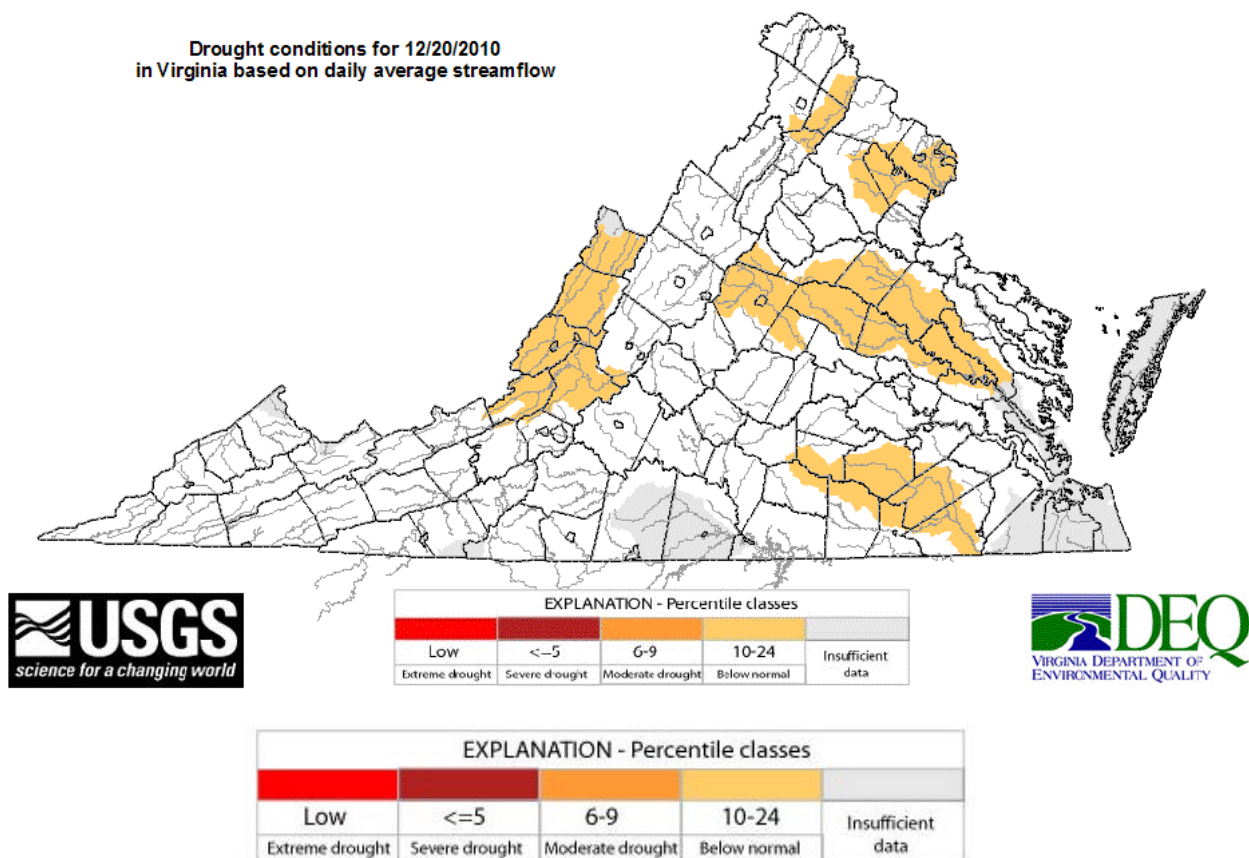
## USGS Streamflow Conditions for December 20, 2010



**Figure 1.** Streamflow conditions for December 20, 2010 in Virginia

# APPENDIX H

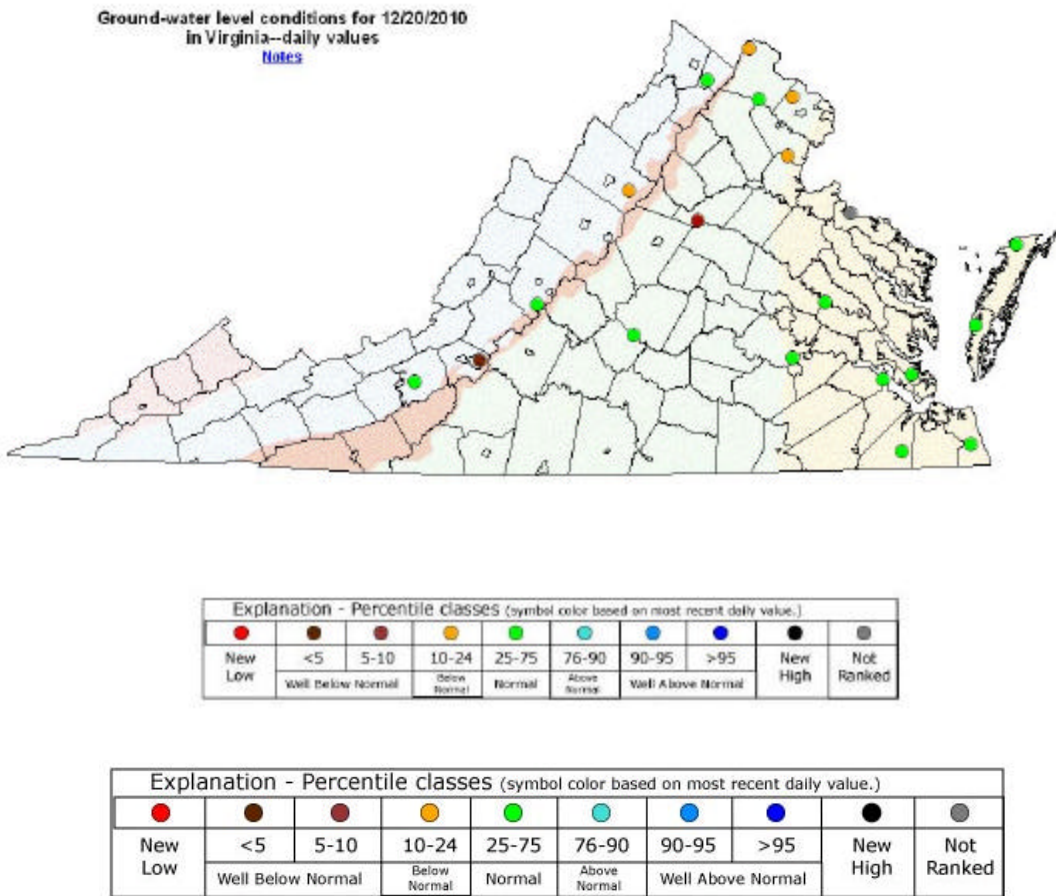
## Drought Watch -- USGS State Information on Drought Map of below normal daily average streamflow December 20, 2010



**Figure2.** Drought conditions for December 20, 2010 in Virginia based on daily average streamflow

# APPENDIX I

## Groundwater level conditions for in Virginia December 21, 2010



**Figure 3.** Groundwater-level conditions for December 21, 2010 in Virginia